middle lobe, and to the lobe of the insula—a small mass of brain tissue placed in the fissure and sometimes called, after its discoverer, the island of Reil. This latter is found in no other animal than in man and the monkey. In the latter, however, it is very slightly developed, and has been said by Huxley and others to present no trace of convolutions. Now there is not a single well authenticated case of injury or disease involving all this region nourished by the middle cerebral artery on both sides in which there was not derangement of the faculty of speech, and there is not a single case of aphasia on record in which if any lesion at all was found in the brain, that lesion was not situated in some part of this region on one or other side of the brain. It is true, there are cases of aphasia occasionally met with in which minute examination after death, fails to reveal the existence of any lesion at all, but we may very properly disregard these, for the like fact exists frequently with other cases of undoubted cerebral disease. In such instances the disorder—probably some derangement of circulation acting instantaneously and for a short time—disappears with the cessation of life.

This region may, after Kussmaul,* be called the "speech tract." The third frontal convolution, the island of Reil, the corpus striatum and the anterior part of the middle lobe, all of which have been shown to be intimately connected with the faculty of articulate language, are parts of this "speech tract."

We are now prepared to consider Dr. Bateman's arguments in favor of the view that articulate speech is a distinctive quality of man, and to meet his objections to the localization of the faculty of language in any part of the brain. W. A. H.

(TO BE CONTINUED.)

IV.—LUDWIG'S ARBEITEN.

ARBEITEN AUS DER PHYSIOLOGISCHEN ANSTALT ZU LEIPZIG. Elfter Jahrgang, 1876. Mitgetheilt durch C. Ludwig. Leipzig: S. Hirzel, 1877. (*Report of the Physiological Institute at Leipzig. Edited by C. Ludwig.*)

Like all its predecessors, the present report of the work done in Ludwig's laboratory is a model of scientific accuracy. Every point investigated therein, however modest its title, and however unimportant its bearings may seem, is a permanent acquisition to physiology.

In the first article, Mr. Ch. S. Minot describes the method of passing a current of defibrinated blood through the vessels of a freshly excised muscle (biceps and semi-tendinosus of the dog). The vessels were first washed out with serum ; hereupon a current of arterialized blood was passed through them. The irritability of the muscle could thus be maintained for several hours.

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*Stoerungen der Sprache, Leipzig, 1877.

Analysis of the amount of CO_2 contained in the blood before and after the transfusion, showed an increase of CO_2 by from 1 to 5 per cent. *The amount of CO_2 gained by the blood in its passage through the muscles was found to be independent of the state of rest, fatigue or activity (electric stimulation) of the muscle.*

In a second paper, Dr. F. A. Falk studies the action of laudanosin, an alkaloid of opium discovered by Hesse (1871), on the circulation. The alkaloid was injected in aqueous solution into the veins of rabbits, which had previously been curarized to avoid the spasms of laudanosin. Small doses, 2½ to 5 milligrammes, both elevate considerably the arterial pressure and increase the frequency of the pulse. These effects are due to stimulation of the vaso-motor centre, and of the accelerator fibres of the heart.

The vagus is not affected by this quantity. Large doses, however, have the contrary effect. They reduce both the arterial tension and the frequency of the pulse. This peculiar reversion of phenomena is caused by the paralytic influence which the poison exerts on the heart itself, when present in large quantity.

Dr. W. H. Gaskell investigated the action of the vaso-motor nerves of the extensor muscles of the leg by measuring the amount of blood flowing through the veins. A canula was so inserted into a venous branch that, during an observation, the quantity of blood issuing from it could be registered, while during the interval the blood current followed its normal path. Large dogs could thus be observed for a long time without suffering a fatal loss of blood. Section of the motor nerve of the muscle increased considerably the amount of blood passing through the muscle. Within a minute, however, the rapidity of the current diminished again, but still it kept above the rate of the uninjured muscle. The natural explanation seems to be that the nerve-trunk contains both vaso-dilator and vaso-constrictor fibres. The former are temporarily irritated by the section, and their influence prevails during the first minute. Subsequently, however, the removal of the tonus of the constrictor fibres maintains still the increase of circulation as compared with the uninjured muscle. The effects of faradization of the motor nerve are very striking. The contraction of the muscle expels suddenly a jet of blood, evidently mechanically. During a short interval the current is much diminished—a period corresponding to the refilling of the suddenly emptied vessels. After this, however, the amount of blood issuing from the canula is enormously increased and remains so during the entire period of contraction. On interrupting the stimulation, the blood-current diminishes again, but still it does not regain its original rate until after some time. This series of phenomena agrees well with the hypothesis of vasomotor fibres, which, when stimulated, prevail over the simultaneously excited *feebler* vaso-constrictor nerves. Finally it was found that the vaso-motor nerves of the muscle were paralyzed by curare.

A similar method was employed by Max V. Frey, in studying the circulation in the submaxillary gland. Here, also, the amount of blood issuing from a venous branch was registered. Stimulation of the sympathetic nerve expelled a sudden slight jet of blood; the result, evidently, of the sudden contraction of the arteries. After this the current was reduced, reaching its minimum in about twenty-five seconds, both when the stimulation lasted fifty seconds, or on the other hand only ten seconds. Within a minute after cessation of the stimulus, the current regained its original rate. Stimulation of the chorda tympani increased the rapidity considerably, but only for a short time, since the irritability of that nerve is rapidly exhausted. Curare, in ordinary doses, does not paralyze these nerves. On stimulating simultaneously both the sympathetic and the chorda tympani with electric currents of equal strength, the action of the sympathetic masks completely that of the other nerve. As long as the stimulation continues, the blood-current is diminished in the same way, as if the sympathetic alone were excited. But on interrupting the faradization of both nerves, the action of the sympathetic stops abruptly, and the after effects of the excited chorda tympani are manifested by a considerable increase in the rapidity of the circulation.

F. Klug examined the sense of temperature in the skin by means of a thermo-æsthesiometer, an æsthesiometer, the points of which could be kept at any temperature, by means of a current of water passing through them. The distance was noted at which the points could just be recognized as two. As a general result it was found that the cutaneous sensibility increased with the difference in temperature between the skin and the instrument. The least sensibility was manifested when the two points had a temperature of 20° C.; the same was the case when one point was cooled to 5° C., while the other was warmed to 50° C. The most acute sensibility was found when both points were cooled to 5° C., or warmed to 50° C., and in the latter case applied to the skin, cooled by immersion in cold water.

The volume contains besides, three articles on the passage of lymph, and one on the histology of the lymphatic capillaries.

H. G.

V.—CEREBRAL HYPERÆMIA.

THE RESULT OF MENTAL STRAIN AND EMOTIONAL DISTURBANCE. By W. A. HAMMOND, M. D. G. P. Putnam's Sons, New York. 12 mo. 108 pages.

In this monograph, from the prolific pen of Dr. Hammond, we have certain views, long entertained by him, enunciated once again and much amplified. As the title rather clearly indicates, the subject is that of the excessive and sustained hyperæmia, which results from over-work or over-excitation of the nervous